MIDDLE ILLINOIS RIVER
WATERSHED ANALYSIS
Iteration 1.0

RESULTS

June 1999

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Statement of Purpose

Ecosystem analysis at the watershed scale is expected to identify locations for restoration and maintenance projects and to further the ecosystem management objectives of the Siskiyou Forest Plan as amended by the NW Forest Plan. The ultimate goal for ecosystem management is to assure sustainable outputs, for people, by restoring and maintaining sustainable ecosystems.

This document is formatted for distribution through the Internet on the world wide web at the Siskiyou National Forest Home Page, our address is: http://www/fs.fed.us/r6/siskiyou/news.htm. This is our primary page for our planning-related documents, you will see Watershed Analyses as an option on this page. The Middle Illinois will be listed as one of those analyses. Underlined or boxed text indicates a linked product.

Introduction

The Middle Illinois Watershed Analysis was initiated in 1999 to provide an ecological context for proposed minerals development, recreation use and development, and timber harvest. It also serves to increase and synthesize our knowledge about this special place. An interdisciplinary team of ten specialists worked on the analysis. The focus of this iteration (1.0) is on the Forest Service managed lands. This focus results primarily due to the presence of data, greater familiarity with that portion on the part of the specialists and our ability to influence management. Coordination with the Bureau of Land Management (BLM), Natural Resource Conservation Service (NRCS), Oregon Department of Fish and Wildlife (ODFW), and members of the public did occur.

The Middle Illinois Watershed Analysis area covers 81,560 acres. It extends from the convergence of the West and East Forks of the Illinois River, includes the towns of Cave Junction and Kerby, and continues down through the river canyon to Briggs Creek. The river corridor itself was a major focus for the team; the majority of human activities that occur in the watershed are concentrated there. The remarkable beauty and resources of the river are an inspiration to our team. A summary of the cultural and administrative history of the river corridor (Appendix A in hard copy) is available.

Approximately 50 percent of the land is this analysis area is underlain by serpentine. Serpentine is a general term that refers to an environment influenced by the unique chemical compostion of the parent materials (serpentinite and peridotite). The species composition and vegetation structure reflect the influence of these unique rocks. The vegetation within serpentine environments differs dramtically from other habitats commonly found in forests of Southwest Oregon. The presence and influence of serpentine rock on structure and process in the watershed will be discussed individually by discipline.

For convenience, the watershed was broken into four distinct sub-basins: Kerby, covering the majority of the privately-owned lands; Josephine Creek; Sixmile Creek; and Oak Flat, the portion downstream of Sixmile. Star Flat, which is actually in the Deer Creek drainage, was included in this analysis. Star Flat was included here as management of this area is managed as part of the river corridor.

Summary of Results

Key Findings

Using the key questions as a focal point the team reached the following key findings:

- Stream side terraces and the large alluvial deposit that underlays Kerby and Cave Junction have been the focus points for human activities in this watershed.
- Over 50% of the area is underlain by peridotite and serpentine rocks.
- Channel form in the main stem Illinois through the alluvial flat is likely altered (straightened) relative to pre-European conditions.
- Sediment related to road construction and use appears to be the dominant source of erosion over background rates.
- Seasonal precipitation and consumptive water uses result in critically low summer flows in the mainstem Illinois. This has adverse effects on salmonid migration.
- Road densities are low on FS managed lands, higher in the privately owned lands.
- Many roads originated for mining access.
- The Illinois is tributary to the Rogue, the Rogue system produces more anadromous fish than any other coastal river in Southern Oregon.
- Anadromous fish stocks present in the middle Illinois are fall chinook, coho, winter steelhead, rainbow trout, and cutthroat.
- There are approximately 17 species of introduced, warm water fish that maintain reproducing populations in the Illinois.
- Winter steelhead populations (estimated via catch records) have declined from 2500 fish in the 1970's to less than 200 in 1992.
- There are several natural migration barriers that are flow-dependant and one man-made barrier within this analysis area.
- Road densities within 300' of streams are highest in the Kerby Sub-basin (1.71 mi/sq mi) and run between 0.5 and 0.6 (mi/sq mi) for the other 3 sub-basins.
- The most common plant series is Jeffrey Pine, followed by Tanoak, Douglas Fir and White Fir.
- The serpentine and non-serpentine soils support distinctly different plant communities.
- Stands developed on serpentine soils climax to a steady state condition that outwardly resembles early to mid-seral stand structures.
- Due to a lack of disturbance (fire or harvest) plant communities are becoming less prepared to adjust to future disturbances. There exists a higher risk for stand replacement events.
- The Kerby sub-basin is dominated by largely even-aged stands 40-50 years old.
- The area is very high in plant species diversity.

- Historic periodicity of low intensity fire in this area was 30-50 years.
- The river corridor is at a high risk for human-caused fire starts.
- Acreage of Old Growth, especially large patches of Old Growth are below historic levels.
- Many stands are overly dense and are unlikely to reach desired conditions without density treatments (fire or mechanical).
- Occupation of this area by native people dates back at least 8000 years, evidence suggests these people wintered along the river and dispersed upland in the summers.
- Using fire, Native Americans managed forest habitats for specific resource outputs.
- Development for mining began in 1850 and continues today, although much reduced relative to historic levels.
- The Siskiyou National Forest was established in 1906, ranger station locations have varied over time and include locations along the river corridor.
- Recreation use along the river has been, and continues to, grow. Developments to accomodate this growth have been implemented, others are pending.
- Motorized recreation is an important use. Driving for pleasure is recognized as the number one outdoor recreational activity for the foreseeable future.

Data Gaps

The team identified the following data gaps:

Physical Science Data Gaps

1. Awaiting release of Natural Resrouce Conservation Service (NRCS) study for water use

2. Awaiting release of NRCS study for channel form and sediment transport. Especially important in Alluvial Flat.

3. Groundwater/surface water interactions in Alluvial Flat

4. Acreages of terraces along Josephine Creek and River

5. Composition of Algal communities on river

6. Summer low flow water quality data-other than temperatures

7. Mapping of Class IV stream channels, especially important in Sixmile Creek

Transportation Data Gaps

1. Maintenance levels on roads in Kerby watershed. This data may be available from the county in 2002.

2. GIS coverage does not include mining roads.

Aquatic Biota Data Gaps

1. Fish, especially salmonids, populations in Illinoiswatershed.

2. Distribution of anadromous and resident salmonid spawning habitat

3. Kerby watershed data gap in terms of riparian stands vegetation - Kerby WA indicates early seral most everywhere.

4. Oregon Department of Fish and Wildlife physical habitat surveys of mainstem Illinois

5. Historical distribution and abundance of salmonids.

Vegetation Management Data Gaps

1. Plant Series map is inaccurate.

2. POC mapping appears to be incomplete, especially in Kerby watershed

3. Historic range of variability for stand replacement patch sizes has limited information.

Botany Data Gaps

1. Assess conditions of sensitive plant populations sites; presence/absence, populations

2. Noxious Weed inventory; where are they, how abundant are they?

Wildlife Data Gaps

1. Distribution and abundance of wildlife; currently all based on habitat, not populations.

2. Historic distribution and abundance of seral stages, size structures.

Fire Data Gaps

1. Don t know about IV Rural Fire plans in Kerby watershed

2. Pre-1941 fire histories.

Cultural Resources Data Gap

1. Mining history needs to be synthesized

2. Grazing history is poorly understood and needs to be synthesized

Recreation Data Gaps

1. Recreation use on the scenic corridor needs to be quantified.

Recommendations

The following lists reflects the priorities identified by all members of the Watershed Analysis Team. The recommendations listed by individual disclipines are also prioritized within that discipline. Refer to the individualreports (web version only) for more information concerning the scientific basis of these recommendations.

Overall Team Recommendations

1. Analyze the roads listed under the Transportation Recommendation #2. Addressing these road related concerns would benefit aquatics, recreation, noxious weeds and wildlife at a minimum.

2. Maintain a fire/recreation position at the Store Gulch Guard Station. A person stationed here reduces recreation conflicts, provides visitor services, and offers a much reduced fire response time.

3. Use density management treatments to maintain and improve stand conditions in Mature and Old Growth, in Savannas, in Meadows and in Bogs.

4. Repair the road safety hazard at Spring Gulch on road 4103.

5. Use density management treatments on sites throughout the watershed.

6. Make monitoring of mining operations an on-going priority, the team especially supports field visits by the District Minerals Technician. The team would also like to see an annually updated map of mining activity.

7. Continue to seek funding and partnerships to complete the TJ Howell interpretative tour.

8. Complete fisheries habitat improvement structures that provide cover and food source at Six-mile and Mike's Gulch. These structures must be designed to be compatible with the Scenic classification of the river at these locations.

Recommendations from individual disciplines:

Watershed Recommendations

1. Address road concerns listed under transportation network

2. Educate valley residents about effects of water withdrawals, work cooperatively with SWCD to identify ways to reduce use.

Transportation Recommendations

1. Safety issue at Spring Creek on 4103 - fix the sinking road.

2. The WA team recommends that an interdisciplinary design team look for opportunities to improve road drainage, better manage ORV use, fisheries, reduce impact on botanicals and improve recreation experience at the following prioritized locations:

Highest priority locations:

a. Mike's Gulch road to Boar Flat and the spur across from Mike's Gulch road off of 4201 (off of 4201)

b. Star Flat all the way around Eight Dollar road, including Deer Creek Road (4201-016).

c. Spurs that head down river from the Green Bridge, especially those on North side

d. Road that goes down to Snailback- 4103-026

e. Rancherie 087 (maintain current RMO's and closure)

f. Oak Flat, poor drainage at crossing of O'Connor Creek , water supply lines in culvert.

g. Road that goes down to Kerby guage.

Moderate priority locations:

h. Spur that takes off of 4103 above Star Flat and goes up to Snailback (shows as a trail)

i. Hornbend spur 4103-045

j. Sixmile spur, 4103-055 that goes to County parcel

k. Spur that goes uphill on right immediately before McCaleb's.

l. Mining spurs near Days Gulch

m. Spurs on Josephine and Canyon

Lowest priority locations:

n. Turnout at Street Place, goes to a meadow

o. Steep gullied portion of 4301 going down to Briggs Campground and Trailhead.

p. Lightning Gulch road, currently breached.

3. More frequent, low impact road maintenance on 4103 and all spurs. Especially important is the spur that provides for a fire escape route for the residents of Oak Flat, road 4103-152.

4. Get a GIS layer for roads that is accurate, include gate report.

5. Review Road Management Objective's for roads within the watershed.

Aquatic Biota Recommendations

1. Protect and enhance existing fish use of cool summer water at Sixmile and Mike's Gulch by installing bundles that will provide cover and food.

2. Update GIS layer for all salmonids-need distribution and critical habitat. Confirm presence and absence on current layer, especially uppermost distribution.

3. Mining-related diversion ditch on Days Gulch needs a fish screen. Reduce water diversions.

4. Riparian disturbance due to recreation at Sixmile should be addressed. Improve riparian conditions via planting and other treatments in managed areas.

5. Decrease riparian road mileage or storm proof roads in Josephine Creek, especially those roads that are not currently listed as system roads.

6. More macroinvertebrate samples needed for baseline, especially at Sixmile Creek.

7. Improve monitoring efforts, including spawning surveys, macro-invertebrates (3 year interval), stream surveys (8-10 year interval).

8. Identify culverts that need to be replaced for fish passage.

9. Complete reports on 1992 survey data.

10. Inventory of ponds and lakes larger than 1 acre, identify any connecting tributaries into which non-native stocked species may escape.

11. Work to eliminate stocking of non-native species within headwaters, especially Babyfoot.

12. Look at Hoover Gulch research natural area for study opportunities that will improve fisheries databases.

13. Repeat Illinois Ecosystem study to compare numbers.

14. Install a smolt trap to get population numbers in the Illinois.

15. Synthesize the rich mining history and extrapolate the level of potential effects to help evaluate instream impacts. Need an actual map of locations to understand spatial distribution and impacts.

Vegetation Management Recommendations:

1. Introduce low intensity prescribed fire to the Jeffrey Pine plant series on ultramafic soils.

2. Density treatments, including fire on the 2800 acres of managed stands, many of which are in LSR. Stands are not likely to maintain ponderosa pine as a component without thinning.

3. Density treatments, including fire in stands containing sugar pine. This needs to occur before the stand reaches 25% crown closure.

4. Use fire as a stand density management tool.

5. Use regeneration harvest as a way to mimic stand replacement portion of a naturally-occurring fire. This will favor regeneration of douglas fir and sugar pine. Patch size will mimic patterns found during fire events. Consolidate patches of previously disturbed ground (aggregate harvest).

Botany Recommendations

1. Coordinate with BLM in treating the Eight Dollar Botanical Area. Consider burning to reduce pine, coffee berry, manzanita and azalea abundance, especially in the fen. Do not burn those sensitive plants where we do not know fire effects. This area also needs clean-up of old household debris.

2.Remove noxious weeds and re-vegetate those same sites. Priority locations include the Selma river corridor and the scotch broom near the Green Bridge.

3. Complete the conservation agreement for Darlingtonia Fens.

4. Continue monitoring burned areas in Days Gulch.

5. Prepare a seed procurement plan for species from this watershed.

6. Burn the ultrafmaficsin the fall, using pocket or strip patterns, not to exceed approximately 1/2 acre treatments. This is necessary as there is an excess of mid sized and taller vegetation and a lot of duff with dead material.

7. ORV use is impacting sensitive plants more than the mining over the entire river corridor. We need public education, to manage use and road maintenance.

8. Seek partnerships to interpret TJ Howell as improvements are implemented.

Fire Management Recommendations

1. Implement the recommendations found in the LSR assessment.

2. Implement fuels reduction burning along the river corridor. This area poses the highest risk of catastrophic fire and unacceptable resource damage, especially visuals. This is due to inaccessibility, relatively long driving times, fuels and ignition sources, and traffic management. This will likely take 20+ years to get this back in line. This is one of the areas highlighted in the Forest Prevention Analysis. This includes starts above and below the road.

3. Maintain a person stationed at Store Gulch for quick response and fire assessment. See discussion under fire recommendation # 2 (above).

4. Manage the eastern boundary of the wilderness such that the risk of spread from the wilderness out to other allocations is low. Maintain the 15 year cycle in Mendenhall.

5. The most critical stand density management issues may be in the Kerby watershed, this area is also urban interface. This area is the number one prescribed fire priority in the watershed. However due to mixed ownerships, likelihood of success in actually convincing multiple owners to apply fire is presumed to be low.

6. Burn the BLM managed lands adjacent to the recently burned prescribed Canyon fire.

7. Coordinate a fire management plan with residents. Make the public aware of funding from ODF for prescribed fire on lands adjacent to FS managed lands, especially residents and Boy Scouts down the river corridor.

Wildlife Recommendations.

1. Maintain and restore patches of interior Mature and Old Growth .

2. Maintain and restore Old Growth, especially large trees, as defined by FEMAT

3. Manage stand density in old growth, savannas, meadows, and Jeffrey Pine habitats.

4. Pull out the gate on the 4105-061 road .

Recreation Recommendations

1. Maintain a Forest Service presence at Store Gulch Guard Station. Continue to restore and upgrade the guard station.

2. Update, revise and continue to implement the *Scenic Illinois River Environmental Assessment for Recreation Developments.* This EA is a guide for future infrastructure along the scenic corridor. Continue to form partnerships with those that love the river, including Boy Scouts of America, Crater Lake Council and private landowners who live along the corridor.

3. Continue to fund and seek partnerships for the TJ Howell Memorial drive.

4. Maintain the current Road Management Objectives for Illinois River road past McCaleb's.

5. Reinstall traffic counters for River monitoring, recreation use. Data is important to document recreation trends.

6. Explore opportunities to interpret the mining history of the Josephine Creek area.

7. Tie in Canyon trail (011) to Josephine Creek 4201-029 road so that it can be better used. Currently the 011 trail does not get much use because it is accessed via the Free and Easy road, Free and Easy access is limited because the beginning of it goes through private land (Q/X ranch).

8. Continue monitoring of non-commercial use on the wild section of the Illinois. This is needed to determine if a limited permit system is required.

Minerals Recommendations

1. Make funding available for more on-the-ground administration of mining sites.

2. Focus clean-up efforts on mining sites.

Conflicts and Tradeoffs:

Implementing the recommendation of one discipline can sometimes results in adverse effects on another discipline. In recognition of those conflicts, and the complexity of land management in general, the team produced the following table to highlight some of those scenarios. This 'conflicts' table is intended to portray the tradeoffs between the various ways of resolving an issue. A full discussion of tradeoffs is perfomed each time an environmental analysis for a specific project is undertaken. This table is intended only as a general framework and does not replace the in-depth analysis required under the National Environmental Policy Act (NEPA).

Potential Conflict or Tradeoffs	Potential Resolutions
Recommendations to treat roads that make them undriveable, could create conflicts (at some locations) with recommendations to reduce stand densities and manage fire (prescribed and wild fire). The primary reason for this conflict is economics; i.e., mechanical thinning of small trees with limited commercial value requires road access to facilitate thinning that is economically viable.	Stand density treatments: · Mechanical treatment of trees with small economic value: reduce stand densities before eliminating road access, especially in Late Successional and Riparian Reserves. Thin to a wide spacing, which facilitates rapid growth to a size that would contribute to the most rapid development of old growth forest habitat possible. Treat roads to minimize adverse affects to water quality and aquatic habitats until the road can be eliminated. · Mechanical treatment of trees with no economic value; road access reduces the cost of treatment, but road access is not needed. Thin to a wide spacing. · Prescribed and wildfire management; identify roads that are critical to success and treat these roads to minimize their adverse affects on water quality and aquatic habitats.
The goal of the Siskiyou Forest Plan to maintain 20% of the area in pioneer seral habitat for associated species (deer and elk) is in conflict with land allocations in the watershed. Deer and elk are indicator species for other species associated with grass, forb, and shrub habitats.	Improve the conditions for forage plants in small, mature, and old growth forest habitat by reducing stand densities.

Potential Conflict or Tradeoffs	Potential Resolutions
Recommendations in the Siskiyou Forest Plan to retain a minimum of 40% soil duff and litter (Standard and Guideline 7-4, pg. IV-44, 1989) may be a conflict with recommendations to underburn and burning hot enough to create suitable conditions for high quality forage. Essentially, soil duff and litter retention recommends low amounts of exposed mineral soil and conditions for high quality forage may require high amounts of exposed mineral soil.	Research the source of this S&G; (i.e., Regional Guidelines), and confirm whether it is directed at prescribed fires in regeneration harvest areas or prescribed fires in all areas. Also, describe historic range of variability for soil duff and litter distribution and abundance prior to effective fire suppression. These are ***DATA GAPs***.
Recommendations to restore the distribution of mature and old growth forest habitat to desired/reference conditions could be in conflict with the distribution of Late Successional Reserve land allocations; i.e., the distribution of LSRs may not reflect historic distribution of mature and old growth forest habitat.	Historically, the distribution of mature and old growth habitat was more patchy than the distribution of Late Successional Reserves in the watershed. If mature and old growth habitat is restored in the entire area of these reserves, the distribution of mature and old growth may not be within the range of historic variation. Furthermore, maintaining mature and old growth on dry aspects within Late Successional Reserves may be difficult or impossible. However, this is a long term issue and, in the short term, restoration could be focused on wetter aspects.
The recommendation to maintain old growth size trees; i.e., over 32'' d.b.h., may be in conflict with timber management objectives in Matrix.	1. Although part of the definition for old growth forest includes trees greater than 32'' d.b.h., trees larger than this are most important to species that need large trees for nesting or denning; e.g., northern spotted owl (*Strix occidentalis*) and black bear (*Ursus americanus*). Impacts to species associated with large trees could be reduced if trees larger than 45'' d.b.h. are not planned for harvest until old growth has been restored within the historic range of variability in the watershed. 2. Only harvest large trees where the harvest keeps other large trees healthy 3. Focus harvest in stands that do not have large trees 4. Recognize that some mitigation occurs in the long term via the LSR allocation and Riparian Reserve allocation.

Potential Conflict or Tradeoffs	Potential Resolutions
Some recreation use along the river may be in conflict with the Aquatic Conservation Strategy. Compaction, off-road vehicle use, sediment delivery, harassment to wildlife, removal and trampling of riparian forbs and grasses, cutting ripairan treees, and human solid waste are all issues.	1. Per RM-2 of the ACS, implement adjustment measures: education, traffic control, use limitiation, specifc site closures, and increased maintenance. 2. Install toilets 3. Harden the use areas 4. Provide increased administration and law enforcement 5. To meet ACS, close some sites 6. To meet recreation needs, open sites.
Some legal mining use along the river may be in conflict with the Aquatic Conservation Strategy objectives. Disruption and elimination of riparian vegetation, critical habitat such as substrate instability, need/justification for road facilities in riparian reserves, other facilities in riparian reserves, and other cumulative impacts	1. Follow ROD standards and guidelines where they do not conflict with existing laws. 2. Monitor approved POO/NOI to ensure they follow requirements of the POO/NOI. 3. Track and share information about location and number of mining operations annually.
Recreation use may result in increased risk of fire starts	1. Education 2. Seasonal restrictions on use of fire 3. Fire Prevention tech at Store Gulch 4. Use of prescribed fire to limit fuels

Watershed Characterization

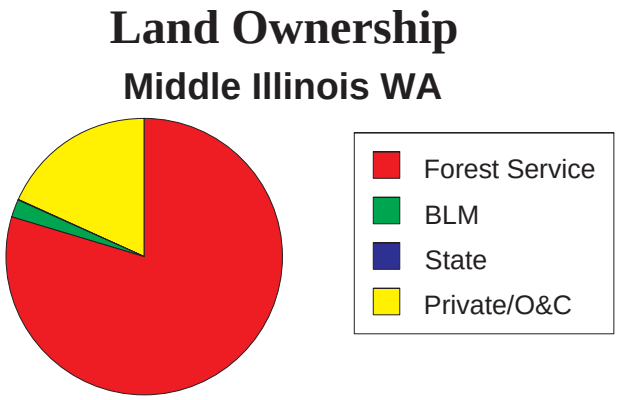
What makes the Middle Illinois Important to People?

The Middle Illinois provides a wide diversity of opportunities for people. The area is reknowned for its outstanding botanical resources. Many people live on the alluvial flat and other places in the watershed. Water from the rivers and creeks is used for recreation, to maintain economic development, and for domestic uses. The outstanding beauty is a source of joy and inspiration to many. Some economic benefit is derived from recreation, mining and timber harvest.

The area includes many special locations and notable features. Some of the items that came to the team were: recreation site at the Green Bridge out of Selma, Mike's Gulch, Star Flat, Pearsoll Peak, Hoover Gulch Research Natural Area, Oak Flat, Forks State Park just above boundary, the rich history of Sebastapol, the unroaded South Kalmiopsis, and the high recreation use. Pomeroy dam, push-up dams, water withdrawals, the sewer treatment plant, the Kerby Ditch and the agricultural lands in Kerby are examples of human uses of and along the river.

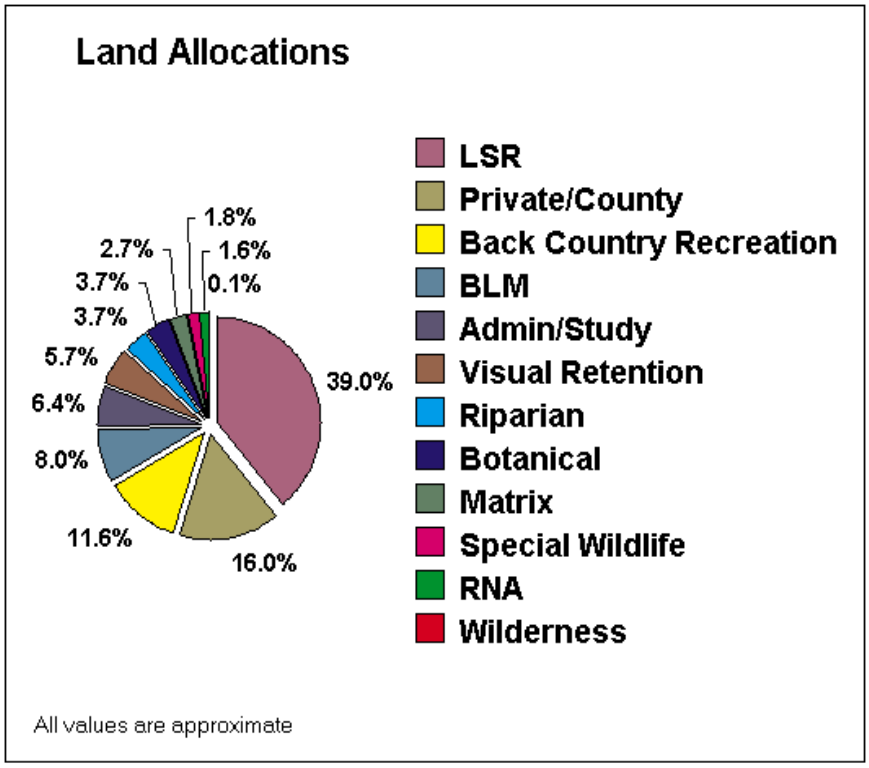
Land Ownership and Management Allocations

Land ownership within the analysis area is mixed, but is dominated by lands administered by the Forest Service. The chart below summarizes the relative proportions of the ownerships.



Values are approximate

Within the Forest Service Managed lands, there are a variety of management allocations. The relative acreage of these allocations and other ownerships are shown in the allocations chart. In general, Late Seral Reserves, lands managed primarily for their value to wildlife, make up the majority of the analysis area (31%). Other dominant allocations are privately owned lands, lands managed by the Bureau of Land Managed, lands allocated to Back Country Recreation and administrative study lands. Lands allocated primarily to timber production make up less than 3% of the analysis area.



Physical Environment

Landforms

The landforms present in this analysis area may be broadly characterized as either:

relatively uniform slopes that make up interfluves between streams,

ridges,

terraces adjacent to stream channels,

landslide deposits

stream channels.

The relatively uniform slopes by far make up the largest area within the watershed. The remaining features, and especially the stream terraces, often are the focal point for people. The majority of the smaller stream terraces are isolated from the stream channel and are relict features from historic channel elevations. Other low slopes are deposits from ancient landslides, the alluvium that underlies Sauers Flat, Kerby and Cave Junction, and ridges.

The stream channels in the analysis area may be broadly segregated into 3 types; high gradient tributary streams, the canyon portion of the Illinois River past Kerby, and the alluvial portion of the river from the Forks State Park through Sauer's Flat. Due to limited road building and access and limited timber harvest, the steep tributaries in the Forest Service portion of the watershed are likely relatively unchanged in regards channel form and process relative to pre-European settlement conditions. The high gradient tributaries in the Kerby watershed have likely been more impacted by human activity and are more likely to experience changes in channel form, higher rates of bed and bank erosion and changes in

sediment transport. The canyon portion of the river is unlikely to have changed much relative to pre-European times because the bedrock bed and banks make this reach highly resistant to impacts.

Channel form in the alluvial portion of the river is very likely to have changed relative to pre-European settlement conditions. The river in this reach is characterized by long, straight reaches dominated by riffle habitat. This land is used primarily for agricultural purposes and the channel appears to be confined in order to maximize land for growing. Straightened channels do not have as many deep pools as do channels that migrate naturally. Straightened channels also tend to be steeper gradient, and there are fewer places where off-channel habitats can provide refuge during high flows.

Geology

The watersheds covered by the Middle Illinois WA are underlain by a diverse assemblage of rock units and their soils. Table 1 gives the acres and percent of the WA area covered by each major rock unit. The geology is broadly characterized by four 'bands' of northeast-trending rock units. The data included in the table below summarizes acres as mapped at the 1:500,000 scale by Oregon Department of Minerals and Geology. Higher resolution maps are available, but not electronically. The majority of the rock units are Jurassic in age, with the notable exception of alluvium along valley floors and terraces, which are Quaternary in age. This area is nested within the larger Klamath Mountains Province, excellent coverage of regional geology is available in "Geology of Oregon" and numerous other texts.

Table 1. Geology of the Middle Illinois Analysis Area

Rock Unit	Ultramafic-Serpentine	Rogue and Galice Formation Metamorphosed Sediments and Volcanics and melange	Alluvium of Quaternary Age Qal), Terrace Deposits (Qtg)	Landslide Deposits large enough to be mapped	Gabbroic and Diabasic Rocks of Jurassic Age	Applegate Metamorphosed Sediments and Volcanics	Briggs Creek Amphbiolite
Acres	40716	7557, 916	3019, 2350	320	2235	15887	31
Percent of Area	50	10	7	<1	3	19	<.1

Erosion Processes

The erosion processes are directly related to the geology. The ultramafics are characterized by landsliding over the long term and sheet, rill and gully erosion in the short term. The Applegate metasediments and metavolcanics are characterized by landsliding and a lesser degree of surface wash. High rock fragment content makes the soils derived from the metasediments more resistant to erosion than the metavolcanics. The Quaternary alluvium is very stable as it occupies largely low gradient slopes. The Galice metasediments are also very stable, steep slopes are subject to rockfall and shallow debris slides.

The erosion processes are also directly related to management practices. Roadbuilding has a multitude of effects including interception of groundwater, routing of flow, compaction, sediment delivery and mass

failures. The rock types in this watershed that are most prone to erosion due to road building and use are the ultramafics and grantics. Very few roads access the relatively small amount of granitic rock in this watershed.

Hydrology

The hydrology of the Illinois River is characterized by a very seasonal distribution of flow. The river peaks in response to rain events, the largest historic peaks occur when that rain melts a snowpack. Summer low flows are the most critical and limiting resource concern, both from the perspective of aquatic biota and in regards water needs for human uses. Summer low flows are a result of many factors, the dominant being the seasonal distribution of precipitation. In addition to low summer precipitation, extensive water use occurs throughout the basin.

The Illinois River is listed as 303(d) listed for violating state standards with regard to water temperatures. Summer water temperatures have been monitored for a number of years at the Kerby gage and in Canyon Creek. In 1998 data were collected throughout Josephine Creek. The data indicate that the river and Josephine Creek commonly exceed State water quality standards for temperature for many days during the summer months. While some heating may reflect historic and current land management, water temperatures are also likely to be naturally high in this area. This naturally high temperature condition is reflected in other unmanaged watersheds where low flows and sparsely vegetated riparian areas are common (e.g. headwaters of the Chetco River). A water quality management plan will be prepared for these areas as required by State Law. The plan is due by 2004.

Watershed Transportation System

The transportation system for this watershed can be accessed by roads that exit off U.S. Highway #199 (Redwood Hwy.). These roads are Forest Service road #2500 (Briggs Valley), County road #5070 (Deer Creek), and County road #5240 (Eight Dollar). There is limited access into this watershed off County road #5300 (Westside) but no easement is permitted to the general public, as this is private land.

Historically, trails paralleled major drainages. With this practice early transportation systems were built along the Illinois River. Miners constructed a trail into the Sixmile and Oakflat subwatersheds to access mining claims. In the 1930's the CCC's helped to improve and construct a more elaborate trail/road system.

Currently there are approximately 273 miles of road within the Middle Illinois Watershed, of which 116 miles are system roads. There are approximately 135 miles of roads outside the USFS jurisdiction, most of these are within the Kerby sub-basin. Overall road densities are 2.1 miles per square mile, there are approximately 2 stream crossings (on average) for every mile of road. The Kerby watershed has the highest stream crossing density (3.2 crossings per mile), the remaining basins have approximately 1.6 to 1.8 crossings per mile. Since 1992, 1.9 miles of road have been decommissioned in the Sixmile basin.

Aquatic Biota

Fisheries Habitat

The Rogue River produces more anadromous fish than any other coastal river in southern Oregon. This productivity depends upon the available fish habitat, riparian conditions, and diversity of aquatic fauna found on small and large tributaries to Rogue River, such as the Middle Illinois River. Anadromous fish stocks present in the middle Illinois River basin are fall chinook salmon (*Oncorhynchus tshawytscha*), coho salmon (*O. kisutch*), winter steelhead (*O. mykiss*), searun cutthroat trout (*O. clarki*), resident

cutthroat trout and rainbow trout. Non-anadromous and introduced fish species are white sturgeon, eastern brook trout, large mouth bass, black crappie, bluegill, brown bullhead, green sunfish, pumpkin-seed, umpqua squawfish, red-side shiners, longnose dace, speckled dace, three-spine stickleback, carp, Cottidae sp., lower Klamath sucker, bridgelip sucker, and pacific lamprey. Most warm-water fish are now able to maintain reproducing populations within the Illinois drainage.

Table 2. Miles of distribution for salmonids within the Middle Illinois River Watershed

	Southern OR/ Northern CA Coho	Southern OR/CA Coasts Chinook	Southern OR/CA Coasts Cutthroat	Klamath Mtns Province Steelhead
Mainstem of Illinois River	*Fish present throughout total = 23.6*			
Daily Ck	0	0	2.3	1.3
Rancherie Ck West Fork	0.6	0	4.0	3.0
Fall Ck	1.9	1.9	6.7	2.6
McGuire Gulch	0	0	1.0	0
Store Gulch	0	0	2.0	0
Sixmile Ck	1.2	0	3.5	2.5
Days Gulch	0	0	1.6	1.7
Fiddlers Gulch	0	1.4	2.9	2.9
Canyon Ck	0	2.0	9.7	6.2
Josephine Ck	0	4.4	13.6	9.7

The winter steelhead population in the Illinois River has declined based on catch records. Sports harvest declined from 2,500 fish in the 1970s to less than 200 fish in 1992. This data has somewhat limited application, as the river is now closed to fishing (for harvest) and creel counts no longer accurately track instream populations. Irrigation withdrawals have been a major impact to steelhead production in the Illinois basin, and the impacts were particularly severe during the recent drought. During drought years, water diversion can have a significant effect on river flow. In the summer of 1992, approximately 50% of the river flow was being diverted (BLM, Kerby WA). Other land management activities, such as logging and mining, have also reduced productive steelhead habitat in the basin.

There are several natural migration barriers and one man-made barrier within the middle Illinois River. Pomeroy Dam, located on the Illinois River about 0.5 miles downstream from the confluence of East and West Forks of the Illinois, is potentially a barrier to some fish during certain portions of the year.

Although the concrete dam is thought not to significantly delay upstream migration of adult salmon and steelhead, juvenile migration may be significantly effected. A series of stop logs in the diversion canal wall (west side of the river) and at mid-river are pulled the first week of November and reinstalled between April and June, not allowing juvenile migration during those months. Adult fall chinook utilize the slot in the canal wall for migration purposes. Higher streamflow later in the year allows coho and steelhead to pass over the center section of the dam. However, during extreme low flows fish passage may be limiting. A fish screen was installed in the diversion canal in 1946. The dam has rights associated that allow for diversion of approximately 27 cfs (water right: 1898, supplemented in 1953) to the Q Bar X Ranch and numerous smaller land parcels.

In 1960-61, the Oregon State Commission funded construction of a vertical slot fish ladder around Illinois River falls, located near private property called McCaleb Ranch. Fall chinook and coho salmon historically may not have been as abundant above Illinois River Falls during low flow years, therefore, its function as a natural fish barrier was dependent on flows. During high flow conditions, it is estimated that as many as 70% of Illinois River adult winter steelhead were successful at migrating past the falls (BLM, Kerby WA).

Riparian Conditions

Riparian stand conditions for the middle Illinois watershed vary by sub-basin and are show below in Table 3. Note that the ultramafic soils in Josephine sub-basin are largely responsible for the low numbers of medium and large sized trees. No systematic stand data is available for Kerby sub-basin.

Table 3. Acres and % of Riparian Vegetation Seral Stages for sub-basins.

Riparian Vegetation Seral Stage	Oak Flats	Six Mile	Josephine Creek	Kerby	*TOTAL
Water/Rock/Grass/Shrub	485 (10.33)	433 (11.24)	774 (13.94)		1692 (12.0)
Seed/Sapling/Pole	1161 (24.74)	777 (20.16)	1913 (34.45)		3851 (27.31)
Pole/Small	947 (20.18)	727 (18.86)	1213 (21.84)		2887 (20.48)
Medium	1464 (31.2)	1253 (32.51)	1266 (22.80)		3983 (28.25)
Large/Giant	636 (13.55)	664 (17.23)	387 (7.0)		1687 (11.96)
	4693 (100)	3854 (100)	5553 (100)		14100 (100)

Table 4. Road density within 300 foot stream buffers

Sub-basin	Rd. Length within 300' riparian area (mi)	% of Riparian Rd length from total miles	Rd. Density within 300' riparian area (mi/mi2)
Josephine	22.34	37.54	0.52
Kerby	41.06	35.62	1.71
Oak Flats	18.37	33.45	0.56
Six Mile	14.80	34.75	0.55
TOTAL	96.57	35.47	0.75

Terrestrial Vegetation - Plant Communities

The most common plant series found in the Middle Illinois is the Jeffrey pine (PIJE) series, followed by the tanoak series (LIDE3), the Douglas-fir series (PSME), and the white fir series (ABCO). Because white fir (*Abies concolor*) and other thin bark climax species are susceptible to repeated fires, Douglas-fir (*Pseudotsuga menziesii*) has emerged as the dominant overstory species on non-serpentine sites. Douglas-fir is associated with fire disturbance and its thick bark insulates it from lethal temperatures. Jeffrey pine (*Pinus jeffreyii*), on the other hand, dominates serpentine sites. The two major soils found in the Middle Illinois River Watershed are separated into serpentine or non-serpentine and support distinctly different plant communities.

Stands in southern Oregon are generally all-aged (multi-cohort) stands of variable tree ages and size classes. This multi-cohort condition is primarily the result of periodic, low intensity fires. The area's fire regime, however, is a combination of frequent, low intensity fires and infrequent, high intensity fires. An infrequent pattern of high intensity, stand replacing fires that creates relatively even-aged structures also occurs.

After moderate to severe disturbances, the sequence of succession, in concept, progresses from early to mid to late seral stage and eventully old growth on typical sites. However, ultramafic soils drastically affect typical plant community development (Hickman, 1997). Serpentine soils climax to a steady-state condition that outwardly resembles early seral to mid-seral stand structures. Serpentine areas are relatively unproductive and contain low amounts of biomass. There are approximately 34,000 acres of steady state (on serpentine soils) within the Middle Illinois River Watershed. Estimated Middle Illinois acres for each seral stage on Siskiyou National Forest managed land is displayed in Table 2. The 15,500 acre Kerby Watershed Analysis by the BLM suggests most of the Kerby sub-basin is early to mid-seral on non-serpentine sites.

Table 5. Estimated Acres and Percentage of Seral Stages in the Middle Illinois River Watershed (PMR data, 1988). This does not include the 15,500 acre Kerby sub-basin.

Seral Stage	Acres	Percent
Early seral	7,100	11
Mid-seral	16,200	25
Late seral	7,400	11
Non-forest	700	1
Steady state	34,000	52
Totals		**100**

- *Early seral*: Includes recently disturbed areas that are vegetated with grasses, forbs, shrubs and young tree stands. Young stands include seedlings, saplings and pole sized trees up to 10.9" DBH. Approximately 7,100 acres meet these conditions. Even-aged timber harvesting has created 2,800 of these acres.
- *Mid-seral*: Trees are generally 11" DBH or larger and are 40-100 years of age. Approximately 16,200 acres meet this criteria.
- *Late-seral*: This seral stage includes mature and old growth conditions. Stands are over 100 years of age and may have a multi-layered canopy. Approximately 7,400 acres meet these conditions.
- *Steady-state:* Lands have 10% crown cover but grow less than 20 cubic feet/acre/year of commercial species.

Other Unique Plant Communities

There are other unique plant communities in the Middle Illinois analysis area. Brewer spruce (*Picea breweriana*) has a geographical range limited to southwestern Oregon and northwestern California. This tree is found on the western portion of the Watershed and at elevations higher than 4,000 feet. Brewer spruce is not a sensitive plant species but has received scientific as well as public interest due to its limited range.

Port-Orford-cedar (*Chamaecyparis lawsoniana*) is limited to coastal-interior lands in northwestern California and southwestern Oregon. Port-Orford-cedar (POC) is distributed mainly within riparian areas throughout the watershed. When growing on ultramafic soils, Port-Orford-cedar can be found as thickets of sapling and pole sized trees, mostly within 15 feet of stream channels or near "sag" ponds with a seasonal high water table. It is also found in the riparian areas in the metamorphic terrain. There are approximately 8,700 acres of POC stands in the analysis area (see POC map).

Port-Orford-cedar root rot is caused by the fungus *Phytophthora lateralis.* This fungus has been killing POC as early as 1922. The disease is entirely dependent on free water for spread and infection and on man for long distance spread. It can also be spread by movement of infected soils such as on vehicle tires or taken as road fill. Once introduced into a streamcourse, POC root disease eventually kills most of the POC downstream and within about 20 feet of the high water line.

POC infected with Phytophthora has not been found in the Middle Illinois Watershed. However the Watershed is considered to be contaminated because infestations are found upstream and above this Watershed. Infestation with root disease is highly dependent on the presence of free water in the vicinity of POC roots. High risk areas are stream courses, drainages, low lying areas downslope from already infested areas, or areas below roads and trails where inoculum may be introduced. Preventing

further spread of the disease should focus on limiting the movement of contaminated soil and water, and removing susceptible host roots from high risk areas.

Disturbance

Regeneration harvesting that occurred between the 1960's and 1990's on National Forest land created approximately 2,800 acres of early seral conditions. These activities were on the more productive Six-mile and Oak Flats sub-basins. The Kerby sub-basin is divided into either private ownership or BLM public lands. Aerial photographs of the Kerby sub-basin taken in 1953 revealed that most of the private lands had just recently been logged, most likely just after World War II (BLM Kerby Watershed Analysis). The private lands, which now contain 40-50 year old pole sized trees, are considered to have included the most productive late seral stands in the watershed.

Fire suppression this past century has placed stands within the Middle Illinois River Watershed at a higher risk for a severe stand replacement events. The Siskiyou National Forest Late Seral Reserve Assessment (1995) recognized the potential for more severe wildfire as fine and coarse fuels increase without disturbances. Suppression of fire has also changed the successional process in the Watershed. Stands historically dominated by Douglas-fir will shift in composition towards the site's potential climax tree condition without disruptions to successional processes. White fir and and tanoak will express dominance and begin to replace the shade intolerant species in this emerging fire regime. Understories will also favor reproduction of these tolerant species. Atzet and Wheeler (1982) state that the high frequency of fire has been reduced, the rate of fuel buildup has increased, and climax tree species are making a comeback.

Due to the recent trend of decreasing ecosystem disturbance within the Middle Illinois Watershed, plant communities are less resilient to future disturbances. Disturbance, or the disruption of succession, is essential to maintain ecosystem stability, biological diversity, resilience, and ecosystem health. According to Atzet and Martin (1991), the future of our forests is tied to management of disturbance processes. Stocking levels are above acceptable levels in the Middle Illinois River due to the lack of disturbance this past century. Therefore, disturbance should be reintroduced in order to strengthen plant communities' ability to respond to change. Prescribed burning, maintenance thinning and harvesting of older stands (though not necessarily compatible with LSR objectives) are management tools that can reduce stand densities and restore the historical role of fire and the importance of disturbance to this Watershed

Ecology plot information gathered on non-serpentine sites within the Watershed found that the most recent disturbance events were human caused, followed by fire and then wind. On serpentine sites, fire and wind were the most prevalent causes of disturbance.

Terrestrial Vegetation - Botany

Species diversity - Landscape overview

The Middle Fork of the Illinois River watershed is an excellent representation of the Klamath-Siskiyou Mountains bio-region, long recognized for its plant diversity and very complex vegetation patterns. The complex geological processes have created a mosaic of parent materials concentrated in southwest Oregon. The presence of extensive deposits of ultramafic soils adds much to the complexity of vegetation patterns, as does the plants adaptation to the effects of frequent fires. Another contributing factor to plant diversity for this bio-region is the placement between the California Floristic Province and the Pacific

Northwest Province, resulting in species at the end of their range from these two regions. There is no complete plant list within the watershed, only a small portion of the watershed has been surveyed.

Ten of the rarest species have had general surveys of their potential habitat and Draft Management Guides (Conservation Plans) completed. This watershed has long been visited by both amateur and professional botanists who have contributed sightings. Additional populations will be discovered with more intensive surveys. The Conservation Agreement for Serpentine *Darlingtonia* Fens and Wetlands is expected to be signed this year. This agreement will protect five federal species of concern, and four regional endemic plant species. *Monardella purpurea* has only one known site in the watershed.

Table 6. Habitat requirements for sensitive plant species

Species	**Habitat Requirements**
Arabis macdonaldiana (inc. *A. serpentinicola)* McDonald's rock-cress **Endangered**	On barren to shrub-covered, shallow, rocky, serpentine soils and Jeffrey pine woodlands . At 500-4,000 feet elevation. Red Mtn., Rough and Ready Creek, Josephine Creek.
Aster vialis Wayside aster **sensitive**	Is found in coniferous forests at elevations ranging from 500 feet to 5,100 feet. Typically occurs on relatively dry upland sites dominated by Pseudotsuga menziesii.
Calochortus howellii *Howell's mariposa lily* **sensitive**	Serpentine soils, dry rocky slopes. Low to middle elevations often on *Ceanothus* covered slopes or in open Jeffrey pine savannah. Endemic to the Illinois Valley.
Camassia howellii *Howell's camas* **sensitive**	Tends to grow on serpentine in open places, in heavy but not necessarily deep soil. Dry or vernally wet meadows.
Cardamine nuttallii var. *gemmata* yellow-tubered toothwort **Species of Concern** **sensitive**	Gravelly serpentine soils on ridges, Jeffrey pine forests, near *Darlingtonia* bogs. Grows on disturbed sites, in sunny and shaded areas. Siskiyou Mtns. of Josephine and Curry Cos.
Carex gigas Siskiyou sedge **sensitive**	Serpentine endemic. Vernally or perennially wet serpentine above 5,000 feet . Generally grows in open, sunny sites with little cover. Habitat often appears dry by flowering time.
Drama howellii Howell's whitlow-grass **sensitive**	North-facing rock crevices, above 4,000 ft. In Oregon known from southern Josephine Co. and one site in Curry Co.
Epilobium oreganum Oregon willow-herb **Species of Concern** **sensitive**	Wet, gently sloping stream banks, meadows, & bogs, generally on ultramafic soil. 1,500-7800 feet elev. Klamath Ranges of CA & OR.
Erigeron cervinus *(=E. delicatus)* Siskiyou daisy **sensitive**	Rocky places or crevices in solid rock. Streambanks; seeps/vernally wet sites. Meadows, pine and fir woods
Erythronium howellii Howell's fawn lily **sensitive**	In open woods, often on serpentine soils or in ecotonal areas. South end of Illinois Valley, Josephine Co., OR south to Trinity Mtns., CA.
Fritillaria glauca Siskiyou fritillaria **sensitive**	Gravelly serpentine slopes and ridges. Southern Douglas Co. south through the Siskiyou Mtns. of Josephine and Curry Cos. in OR.

Species	Habitat Requirements
Gentiana setigera Waldo or Mendocino gentian **Species of Concern** **sensitive**	Serpentine wet meadows and bogs, seeps on slopes at low elevations. Del Norte Co., CA. Siskiyou Mtns.
Hastingsia bracteosa large-flowered rush-lily **Species of Concern** **sensitive**	Wet meadows, rocky seeps, serpentine *Darlingtonia* bogs at lower elevations, often in open areas on gentle slopes. Limited range in Josephine Co.
Hieracium bolanderi Bolander's hawkweed **sensitive**	Dry brushy slopes on serpentine soils at any elevation. Klamath Mtns. in Coos, Curry and Josephine Cos.
Lewisia cotyledon var. *purdyi* Purdy's lewisia **Species of Concern** **sensitive**	Granitic or seprpentine rock outcrops, full sun or partial shade at 2,000-4,000 feet elevation. Kalmiopsis Wilderness and vicinity in Curry & Josephine Cos.
Lewisia leana Lee's lewisia **sensitive**	Rocky or gravelly ridges or benches at higher elevations often on serpentine soils. Siskiyou Mtns. of southern Josephine & Douglas Cos. OR.
Limnanthes gracilis var. *gracilis* slender meadow-foam **Species of Concern**	Sunny vernally wet meadows and stream edges, in valleys and low foothills, including serpentine soils, below 2,500 feet. Illinois Valley, Rogue River Valley of Josephine and Jackson Cos.
Lomatium engelmannii Englemann's desert-parsley **sensitive**	Gravelly, serpentine slopes in coniferous forests and open areas at 3,000-6,000 feet elev. Siskiyou Mtns. and adjacent CA.
Lomatium tracyi Tracy's desert-parsley **sensitive**	Open pine forests on serpentine at 1,500-4,500 feet elev. Siskiyou Mtns.
Lupinus tracyi Tracy's lupine **sensitive**	Dry openings, edges of forest, or in open woods on granitic soils at moderate to high elevations. Often with the ground cover *Arctostaphylos nevadensis*.
Microseris howellii Howell's microseris **Species of Concern** **sensitive**	Found on slopes or flat ground with varying exposures, in rocky serpentine soils from 1,000- 3,500 feet elevation. Siskiyou Mtns.
Monardella purpurea Siskiyou monardella **sensitive**	Rocky, open slopes on ultramafic soils at 1,400-4,000 feet elev. Chaparral, woodland, montane forest. Curry and Josephine Cos.
Perideridia erythrorhiza red-root yampah **Species of Concern** **sensitive**	Vernally moist depressions in heavy poorly drained soils, below 5,000 feet elev. Josephine County sites on serpentine soils. Often grows in association with *P. oregana*.
Salix delnortensis Del Norte willow **sensitive**	Streambeds, streambanks, and gullies on serpentine soils. Habitat may be dry in summer. Low elevation up to 1,500 feet.
Sedum laxum ssp. *heckneri* Heckner's stonecrop **sensitive**	Dry rocky places. Metasedimentary outcropings or serpentine soils at elevations ranging from 300 to 5,500 feet.
Senecio hesperius Siskiyou butterweed **Species of Concern** **sensitive**	Endemic to the Illinois Valley, found on serpentine soils at lower elevations, on gentle to moderate slopes. Generally in open Jeffrey pine savannah.
Sophora leachiana Western sophora **sensitive**	Endemic, typically found on slopes in open mixed evergreen/hardwood forest from 500 to 4,500 feet elevation. Siskiyou Mountains, in OR.

Species	Habitat Requirements
Streptanthus howellii Howell's streptanthus **sensitive**	Dry, rocky, serpentine slopes in open conifer/hardwood forest from 1,000 4,500 feet elevation. Del Norte Co., CA. Siskiyou Mountains, in OR.
Viola primulifolia ssp. *occidentalis* western bog violet **Species of Concern** **sensitive**	*Darlingtonia* bogs on serpentine soils at lower elevations. Del Norte Co., CA. Curry and Josephine Cos., OR.

Noxious Weeds and Exotic Plants

Complete field surveys have not been conducted in the analysis area but past surveys in the district have shown several species of noxious weeds and common exotics present, such as:

Table 7: Noxious Weeds.

Species and Status	Habitat
Bromus tectorum cheat grass	Disturbed areas.
Centaurea sp Knapweed	Disturbed areas, meadows, roadsides.
Centaurea solstitialis yellow star-thistle	Disturbed areas, alongside roads, river corridor.
Circium vulgare bull thistle	Every road, landing seems to have at least one plant.
Cystisus scoparious Scotch broom	Old homesteads, mining areas, along roadsides, some campgrounds.
Elytrigia intermedia intermediate wheat grass	Introduced grass for revegetation purpose.
Holcus lanatum velvet gras	Introduced grass for feed and revegetation purpose.
Lathyrus latifolius everlasting peavine	Has invaded seeps, springs, around culverts.
Rubus discolor Himalayan blackberry	Patches along roadsides, disturbed areas, homesteads, seeds carried by birds.
Taraxacum officinale dandelion	Meadows, a few scattered plants.
Trifolium repens white clover	Introduced wildlife species to improve habitat.
Verbascum thapsus mullein	Introduced with cattle feed, spread to plantations. Has become an important wildlife food source.

Unique Plant Communities and Botanical Land Allocations

The watershed has two types of key habitats in the ultramafic soil type: wet and dry serpentine that may be suitable habitat for several species on the sensitive plants list as well as species endemic to the Siskiyou National Forest. These species all inhabit ultramafic sites, which have soil mineral imbalances that prevent dense sites from growing; therefore the plants are found in forest openings or even barrens. These areas are sometimes incidentally disturbed or destroyed by roadbuilding, skid trails, mining, recreational vehicles or side effects from these activities. Although portions of the project area has been impacted by past activities, most of the suitable ultramafic habitat for serpentine endemic plants is intact or, if disturbed, is still within the tolerance limits of the species of concern.

Eight percent of the watershed is in a land allocation designated to protect botanical resource values.

Table 8: Botanical and Research Natural Areas

Botanical Area	Acres	Description	Issues	Planning Needs
Days Gulch Botanical Area	1,252	All serpentine habitat	Serious mining and OHV damage to hydrological processes. Exotic vegetation.	Fire monitoring, weed eradication, road improvement.
Eight Dollar Mountain Botanical Area	2,738	Serpentine/peridotite. High concentration of rare plants.	High visibility and public use. Trees and shrubs over stocked. Garbage, mining, and OHV damage. Exotic vegetation.	Secure funding for boardwalk and interpretation. Burn to increase water table. Clean up, Monitor road decommissioned.
Hoover Gulch Research Natural Area	1,284	Mixed evergreen forest, permanent stream.	Lack of surveys.	Survey, visit to determine needs.

Fire Management

Fire has always been an integral part of the forest ecosystem in southwestern Oregon, and the Siskiyou National Forest, which have had a long history of wildfire occurence (Payne 1983, Haefner 1975, Cooper 1939, Morris 1934). In the warm-temperature, dry-summer, "Mediterranean" climate of the Siskiyou Mountains, the forests are easily set afire, fires of widely varying intensities have been fequent (Whittaker 1960), and the spatial distribution of fire is variable. There are places where 190-year-old trees show no evidence of fire. At the other extreme, a ponderosa pine had 11 scars. Atzet and Wheeler (1982) determined fire cycles of 20 years for inland plant associations with a cycle length increasing to 60 years or more for coastal areas. For this watershed, the natural cycle is between 30 and 50 years, depending on aspect, elevation and fuel model or plant series for low to moderate intensity fires, 60 to

100 years for moderate to high intensity fires, and large stand replacement fires occuring every 100 to 200 years.

Fire Exclusion Effects

Exclusion of fire can reduce the natural mosaic patttern in vegetation heights and age classes, creating larger contiguous areas of vegetation of uniform heights and uniform fuel conditions. This creates an increase in areas experiencing similar wildfire behavior and can result in a more uniform fire intensity occurrence. Natural old growth forests typically have an uneven mosaic of size classes, which act as a buffer from catastrophic crown fires (Kauffman 1990). This buffer effect is lost as vegetation becomes more uniform.

Effective fire suppression programs have created a relatively fire-free condition during the last half of this century. Atzet and Wheeler (1988) found few scars on trees in stands less than 70 years of age. Fire suppression has reduced the occurrence and the numbers of acres burned. Thomas and Agee (1986) found that fire suppression has effectively eliminated up to five fire-cycles in the mixed conifer stands of southwestern Oregon. This has lengthened the fire-free period vegetation has previously experienced.

Using interpreted satellite imagery data, seral stage structure of pioneer, early seral, midseral, late seral, and climax vegetation condition classes these values were grouped to create a fuel model map for determining fire behavior. At one time, most of the watershed was probably a Fuel Model #2(Grass Group) on the West-East slopes and a Fuel Model #8(Timber Group) on the Northerly slopes.

Table 9: Fire Behavior Fuel Models

Fuel Model	PMR Type	Rate Of Spread	Flame Length	Acres
5	Pioneer	18	4	18,704
6	Shrub	32	6	6,058
8	Mid	1.6	1	17,652
9	Early	7.5	2.6	14,376
10	Late/Climax	7.9	4.8	7,414
Total				**64,204**

An analysis of fire occurence was made based on fire occurence records from the Siskiyou National Forest. This data is from all the fire reports on record for any fire within the Middle Illinois Watershed from 1941 to 1998. Six fires of 5 acres or larger were recorded from 1941 thru 1998. Most notable was the Mendenhall fire of 1994. This fire burned 6998 acres of the Siskiyou National Forest, and 160 acres of BLM lands for a total of 7158 acres. Table 10 details fire occurrence history for the analysis area.

TABLE 10: Fire History (1941-1998)

Cause Of Fire	No. Of Fires	Frequency
Lightning	23	38%
Human	25	41%
Unknown	13	21%
Total	61	100%

Human caused risks associated with the Illinois River corridor from the forest boundary downstream cannot be entirely eliminated; but the risk of catastrophic fire occurence can be reduced through vegetation management and hazardous fuels reduction projects.

Private lands within the watershed have been heavily harvested from the late 40's to present times. Much of this private land has not had hazardous fuels reduction to the statndards set forth on forest service lands. Oregon Department of Forestry has authority through Senate Bill 360 to recommend and assist private landowners with hazardous fuels reduction projects. USFS has authority under the Wyden Amendment to participate with other agencies and private landowners to perform hazardous fuels reduction not on national forest lands for protection, restoration and enhancement activities.

Desired Future Condition

A reduction in the potential for large, high intensity, wildfire is desired in order to meet anadromous fish habitat and other ecosystem function objectives. This potential can be reduced by manual vegetation manipulation and/or prescribed burning to produce conditions limiting fire spread and high intensity burns.

Vegetation manipulation would be designed to decrease fire rate of spread and reduce intensity to prevent stand replacement fire events. These efforts include stand density management, slash disposal, use of hazardous fuels reduction to reintroduce fire in natural stands, and utilization of natural and other barriers to limit fire spread. Fire needs to be used when the stand conditions and prescriptions are right. In some situations it is important to bring thinning and other silvicultural treatments ahead of fire use, to reduce the biomass in these fire-dependent forests before we can use hazardous fuels reduction projects at the right intensities

Wildlife

Species of Concern

Of the more than 200 vertebrate and thousands of invertebrate wildlife species that might be in the Middle Illinois River watershed, the wildlife species of concern are:

- Species federally listed as ''proposed, endangered or threatened'' by the Endangered Species Act.
- Species listed as Sensitive by Region 6 or Region 5 of the USDA Forest Service.
- Species identified as ''survey and manage, needing more analysis,'' or ''management indicator species'' by the Siskiyou Forest Plan as amended by the NW Plan.

Although distribution and abundance of species of concern and locations of individuals are important for managing species, a large DATA GAP exists for most animals. Except for a handful of ''listed'' species, little is known about wildlife distribution and abundance in this watershed. Systematic surveys for a few species have been conducted, primarily in past project areas, and data about other species comes primarily from incidental sightings. Location information is important for maintaining wildlife that are threatened with extinction, such as peregrine falcons and northern spotted owls, because human activities that may have negative affects on nesting success can be avoided during breeding season. Northern spotted owls are known to nest in the Middle Illinois River watershed.

Although location information is important to management activities near some species, habitat management has the greatest effect on all species. If adequate habitat for species of concern is not present in the watershed, these species will not be there. Conversely, if conditions they need are present,

species of concern could occur in the watershed. Adequate habitat is a function of identifying appropriate habitat elements to measure, and determining the distribution (where) and abundance (how much) that is necessary for meeting the needs of wildlife.

Habitats with the most vertebrate species of concern using them as primary habitat are:

- riparian/aquatic (18 species)
- old growth forest (17)
- Interior mature and old growth forest, as well as large trees with deformities - such as cavities, witch's brooms, and large limbs - are also identified as important wildlife habitat characteristics by the NW Forest Plan.
- mature forest (11)
- snags (15)
- large down wood (11)

Disturbance

The process of disturbance on habitat elements has profound effects on species distribution and abundance, and therefore ecosystem sustainability. Disturbances, especially fire, have changed the distribution and abundance of these habitat elements for millennia, and species are adapted to this natural range of variability. In fact, some species require disturbance. For example, ancient pine and Douglas fir trees reached large sizes because periodic low intensity fires removed competing vegetation.

Table 11, Wildlife Key Findings, uses reference conditions from other watersheds to determine the desired future condition for the Middle Illinois ecosystem. Other watersheds were used because the reference/historic conditions that can be reasonably modeled and checked against aerial photos, about 1940, were heavily influenced by mining activities in the watershed and may not represent a condition within the average range of historic variability.

Table 11: Amount Needed To Restore Habitat Components To Desired Condition

Habitat Components	Current Condition (see Size/Structure Map)	Desired/Reference Condition	Amount Needed to Restore to Desired Condition
	Acres and % of FS administered lands in the Middle Illinois River Watershed ''Capable'' of growing Old Growth forest (not serpentine)		
Grass/Forb	Much less than the past. Amount is a DATA GAP	Meadows & brushfields restored and grass/forb & shrub abundance increased in forested habitats. Amount is a DATA GAP	DATA GAP
Shrub Dominated			
Pole/Sapling	3860 ac. or 14 %	4281 ac. or 15 %	-421 ac. or -1 %
Young Forest	7090 ac. or 25 %	4281 ac. or 15 %	-2809 ac. or -10 %

Habitat Components	Current Condition (see Size/Structure Map)	Desired/Reference Condition	Amount Needed to Restore to Desired Condition
	Acres and % of FS administered lands in the Middle Illinois River Watershed ''Capable'' of growing Old Growth forest (not serpentine)		
Mature Forest - 21-32'' d.b.h. -(8-16 trees per acre)	10519 ac. or 37 %	5709 ac. or 20 %	-4810 ac. or -17 %
Old Growth - >32'' d.b.h. - (8-16 trees per acre)	6052 ac. or 21 %	11417 ac. or 40 %	5365 ac. or 19 %
Interior Mature and Old-Growth	1041 ac. or 16 % ***(See map*** current interior mature and old growth forest habitat)	19476 ac. or 30 % in large well-connected patches.	9075 ac. or 14 % of WA. Restoration is a function of location; i.e., proximity to existing interior habitat. The total amount of acres that need treated could be less, if treatments are at the proper locations, or more, if not at proper locations.
Riparian Reserve, Grass/Shrub	DATA GAP	DATA GAP	DATA GAP
Riparian Reserve, Pole/Sapling	934 ac or 15 % of RResv.	620 ac or 10% of RResv.	-314 ac or -5 %
Riparian Reserve, Young Forest	1442 ac or 23 % of RResv.	930 ac or 15 % of RResv.	-512 ac or -8 %
Riparian Reserve, Mature Forest - 21-32'' d.b.h. -(8-16 trees per acre)	2402 ac or 39 % of RResv.	1240 ac or 20 % of RResv. ***See***	-1162 ac or -19 %
Riparian Reserve, Old Growth - >32'' d.b.h. - (8-16 trees per acre)	1423 ac or 23 % of RResv.	2790 ac or 45% of RResv.	1367 ac or 22 %
Cliffs, Rock outcrops, Caves, and Talus	Developed rock pits and reduction of micro-climate by timber harvest have degraded habitat quality	Minimize disturbance of sites.	DATA GAP
Dead Wood: Large Woody Material and Snags	Below desired condition in many managed stands	See Siskiyou Guidelines	Meet Siskiyou Guidelines
Pine/Oak Savanna (provide food for more animal species than any other plants (Martin, Zim, and Nelson, 1951)	Heavily encroached by undesirable trees and brush.	Healthy pines and deciduous oaks with grass/forb understory	All places where this habitat occurs

Social: Cultural Resources and Mining

Native American History: Prehistory and Ethnography

Broadly speaking, the native people of the region were hunter-gatherer-fishers who made their living from a wide variety of natural resources to be found in the narrow canyons and small interior valleys they occupied. People wintered in semi-permanent villages located along major rivers and dispersed during the spring-summer-fall season to exploit upland resources. The archaeological record reflects this subsistence-settlement system. Ethnographically, the region was occupied by Penutian and Athapaskan speakers. Tribes included the lowland Takelma of the upper Illinois River. Pit house village sites have been recorded on the wild section of the Illinois River (Steep 1994). A village site was reported at the mouth of Deer Creek. Many sites were lost as river terraces were mined for gold beginning in the late 1850's. Traditional Native American cultures were effectively destroyed in the Illinois Valley area by the arrival of miners in the early 1850's, and the subsequent Rogue Indian Wars. At present there does not appear to be any formal use of the area by Native Americans.

Indian Burning

Fire is an important aspect of ecosystem function in southwest Oregon. Major plant communities are dependent on fire and other types of disturbance to successfully maintain ecosystem health (Atzet and Martin 1991). In this context, Native Americans played an active role in maintaining fire dependent communities over time, and in establishing themselves as the dominant "edge dependent species" (Bean and Lawton 1993; Lewis 1989, 1993).

There are numerous parallels between modern vegetation management and Indian burning. Each seek to maintain an array of early to mid-seral plant communities across the landscape. Such communities provide small and big game habitat, natural fuel breaks, and for native populations various edible plant foods, materials for basketry and other technological uses. Other uses for Indian fires included hunting, crop management, insect collection, pest management, warfare, preparing foods, and clearing areas for travel (Williams 1993).

One consequence of the removal of Native Americans through either direct violence or forceful removal to reservations was the interruption of periodic burning of specific plant communities, especially those communities found at the interface of oak-pine valley woodlands and forested slopes. Miners, by contrast, tended to burn indiscriminately to improve access to mining areas. Burning by miners, and other Euro-Americans, embodied an "*ecological transition*" which changed the distribution of habitats and array of seral communities across the landscape, and may have contrasted sharply with those communities which existed over time from Indian burning. The legacy of burning from mining and the subsequent distribution of plant communities across the landscape may bias our vision of what we consider to be pre-settlement conditions.

Indian Use of River Resources

The importance of anadromous fish resources to aboriginal societies is well documented in the ethnographic literature for northwestern California and southwestern Oregon (Hewes 1942, 1947; Kroeber 1925; Kroeber and Barrett 1960; Rostland 1952; Suttles 1990). Estimated total yearly consumption of salmon in native California, which includes northwestern California watersheds, is estimated at over 15 million pounds (Hewes 1947). Chinook salmon, Oncorhynchus tschawytscha and silver or coho salmon, O. kisutch dominated aboriginal fish harvest. The abundant seasonal runs and

ease of procurement of anadromous fish strongly influenced the distribution of aboriginal settlements and the spiritual life of native peoples.

The distribution of villages and camps along the Rogue and Illinois Rivers and their tributaries attest to the importance of obtaining and processing fish. Major villages were often located near falls or rapids to facilitate harvesting. Examples are the village sites at Gold Hill and Marial on the Rogue River, the village site of *Tlegetlinten* located at the confluence of the Rogue and Illinois Rivers, and McCaleb's Ranch located within walking distance of a falls on the Illinois River. These same sites are used by fisherman today.

Euro-American History: Gold Mining

The discovery of gold in southwest Oregon brought about tremendous change in the Illinois Valley area. The first known trails into the Illinois Valley from the west were opened in early 1851, bringing people from Trindad, California, and over the Siskiyous from above present day Happy Camp. Reviews of regional environmental and mining history are found in McKinley and Frank (1996), Ramp and Peterson (1979), and Francis (1988).

In the spring of 1851 the first road from the southern Emigrant route was opened over Hays Hill and into the Illinois Valley by the Rawlings party. Like many others of that time period, the Rawlings entered the Illinois River basin in search of gold. Lead by an native American guide, they found gold at the mouth of Josephine Creek in May of 1851. Josephine Creek and later Josephine County was named after Josephine Rawlings, a young member of the original discovery party (Street 1971).

Mining activities eventually covered a wide area within the analysis area. Josephine Creek and Canyon Creeks, and their tributaries, were intensively mined from 1852 through the early 1900's and had important production (Brooks and Ramp, 1968: 194; Ramp and Peterson, 1979: 30). Placer sites in the watershed include Sixmile Creek, Hoover Gulch, Rancherie and Briggs Creeks, and Oak Flat (Brooks and Ramp, 1968: 194).

The town of Kerby played an important role in the development of mining in the Josephine Creek and Canyon Creek area. Kerby was named after James Kerby who took a donation land claim in 1855. Originally called Kerbyville, the town was at one time the county seat and served as a stage stop for the Crescent City Stage. Kerby also served as a trading center for the miners of the Canyon Creek area.

By 1855 the Chinese had arrived in southwestern Oregon to participate in the regions' mining boom. The overwhelming majority of these immigrants came from the impoverished farming and fishing villages of southern Kwangtung ("Canton") Province in southeast China (LaLande, 1981). The typical immigrant considered himself a "sojourner" who was usually intent on returning home when financial circumstances allowed. Chinese mining sites are common in the Siskiyou Mountains and sites have been documented in the watershed analysis area (Boyd, 1991). Sites located at Canyon Creek are typically stacked rock walls with associated camp sites.

Subsistence mining occurred in the area, primarily in Josephine Creek, during the 1930's. This was in response to the economic conditions generated by the Great Depression.

Livestock Grazing

After the decline of mining, livestock farming grew in the Illinois Valley, and certainly lands within the analysis area were used for grazing. The number of cattle doubled in Josephine County between 1875 and 1883 (McKinley and Frank, 1995: 85). Sheep were also raised and large numbers grazed high mountain meadows around the turn of the century. Atzet and Wheeler (1982: 5) state that "Sheep grazing has been a significant influence on the vegetation of the Klamath Province, particularly in the high elevations... In 1903, a typical year, 103,000 sheep and 7,500 cattle grazed the backbone of the Siskiyou Mountains between where Interstate 5 and U.S. Highway 199 are now located. By 1917 most meadows along the Siskiyou crest were 'badly depleted'." Cattle and sheep tend to change understory composition, reduce fine fuel loadings, and create conditions for the establishment of exotics. In addition, unregulated grazing causes the deterioration of soil conditions.

U.S. Forest Service

The Siskiyou National Forest was created on October 5, 1906. Ranger stations were established at Page Creek in the Takelma area in the spring of 1909 and at Star Flat sometime after; Mr. M. M. Lewis was the Ranger at Page Creek (Cooper 1939). The Civilian Conservation Corps (CCC) was active in the area during the Great Depression. A CCC camp, Camp Kerby (F-47), Company 1746, Medford District, was located in Kerby. A side-camp was located at Cold Springs, just south of Canyon Peak. The CCC constructed the Store Gulch Guard Station, and possibly the campground, in 1933.

Watershed Recreation Use

Tourism is the third largest industry in Oregon. In 1988 visitors to Jackson and Josephine counties spent $126,235,000 creating 2,826 jobs (Runyan 1991). Approximately 73% of all visitors to southern Oregon are from out-of-state. Regionally, "driving for pleasure" and "sight-seeing" are ranked the #1 and #2, respectively, demanded outdoor recreation activities in 1987, and are projected to remain 1 and 2 through the year 2040 (USDA FS 1993).

Wild and Scenic Illinois River

In 1968 the Illinois River was named as a candidate for inclusion into the National Wild and Scenic River System (NWSRS). It was legally added to the system in 1984 (PL: 98-494). The final designation includes 50.4 miles of the Illinois River in the NWSRS. Wild and Scenic management allocations for the Illinois River within the watershed analysis total 2,350 acres. Many consider the Wild Illinois River the "wildest" river in the lower 48 states.

The Scenic portion of the river extends for 17.9 miles, from the forest boundary to Briggs Creek. This section of the river is managed to provide recreation facilities and activities appropriate to the designated Recreational Opportunity Spectrum (ROS) class for the area; Roaded Natural and Semi-primitive Motorized. Table 12 displays the current status of infrastructure development along the scenic section of the river.

Table 12: Scenic River Recreation Facilities

Name	Facilities	Type	PAOTS*
Eight Dollar Bridge	1 vault toilet	day use/overnight	25
Six Mile	1 vault toilet; fire rings	above and below road camp sites	50
Store Gulch CG	1 pit toilet; picnic tables; fire rings	access to river via trail; overnight/day use	10
Iron Ring	1 vault toilet	overnight/day use	15
Miami Bar	1 vault toilet	white water put-in	15
Briggs Creek Trail-head	1 pit toilet (needs to be replaced or upgraded)	day use/overnight; access to wilderness	24
Fall Creek/Swinging Bridge Trailhead	trailhead parking/swinging bridge	day use	*

***PAOTS= People at One Time**

In 1968 the entire Illinois River from the headwaters to Agness was closed to mineral entry in order to determine its eligibility to the NWSRS. Subsequent decisions closed the portion from Deer Creek to Briggs Creek to mineral entry. Withdrawal status is reviewed at approximately 20 year intervals. The last review was in 1994. Only the section of the Illinois River down stream of its confluence with Deer Creek is withdrawn form mineral entry at this time.

Scenic River Use

The majority of recreational use occurs between Six Mile Creek and McCaleb's Ranch. The high use season is between May 1 and September 30. This section of river contains numerous turn-outs and short trails to access the river. The most popular activities are swimming, picnicking, and overnight camping.

Traffic count data for the years 1990-1993 indicate an average 113 cars per day, with an average daily high of 147 cars per day in 1992 during the high use season. More recent data is unavailable. Parking can be tight, with as many as 30 cars parked across from the Store Gulch Guard Station. High numbers of people has led to such problems as speeding, drunken driving, littering, firing of guns, the presence of human waste, and other use conflicts. In the Iron Ring and McCaleb's Ranch areas, conflict has risen due to the proximity of private property.

Trails and Other Recreation Use

Traditionally the watershed has been traversed to access other areas, notably the Onion Camp/Babyfoot Lake high country area, which is located just outside of the analysis area in the Chetco River watershed. These areas serve as day use destinations, as well as portals of entry into the Kalmiopsis Wildernesses. The Chetco Pass area serves as trailhead access to the wilderness but the condition of the road 4103-087 requires a 4WD vehicle. Pearsoll Peak lookout sits on the edge of the analysis area and is a highly popular overnight destination

Roadless Areas

Approximately 52% of the watershed analysis area is in roadless status (66% of NFS lands). The area contains portions of the North Kalmiopsis, South Kalmiopsis, and Squaw Mountain Roadless Areas, for

a total of 42,765 acres. These Roadless Areas were allocated to specific management through the Forest Plan of 1989. Table 13 displays roadless area acres for the watershed.

Table 13: Roadless Areas in the Watershed

Name	Acres in Watershed	Roadless Area: Total Acres	% of Roadless Area in Watershed
North Kalmiopsis	4,620	89,748	5%
South Kalmiopsis	33,323	104,900	32%
Squaw Mountain	4,822	7,704	63%

For a complete description of Roadless Areas see Appendix C-Volume 1: Final Environmental Impact Statement, Land and Resource Management Plan, Siskiyou National Forest.

Backcountry Recreation

The analysis area contains three areas allocated to Backcountry Recreation (MA-6) Dailey, Pearsoll, and Fall. Total acreage is 9,444. The areas are classified in the Forest Plan as "motorized backcountry"; provide a recreation setting appropriate for Semi-Primitive Motorized recreation use. These areas are located in the western portion of the watershed bordering the Kalmiopsis Wilderness and the Illinois River.

Economics and Demographics

The following discussion is based on Cosby (1997).

Agriculture, wood products, tourism, are the province's three basic industries. Recent data indicates that the main area of the employment expansion will be in the trades and services industries. Although there has been growth in construction and non-timber related manufacturing, there is still strong reliance upon the wood products industry for this area's economic well-being. The decline in wood products activity through the 1980's was locally amplified by the nation-wide recession. Projections by the State of Oregon Employment Division indicate that the timber industry is expected to lose an additional 1,100 jobs statewide over the next 10 years.

Josephine county has consistently rated among the least wealthy of Oregon counties. Unemployment ranges to 8%, and the per capita income in 1995 was $15,581. This ranges from 80.2% to 85% of the State's per capita income. Typically, citizens in this region are older, retired individuals who rely heavily on income from Social Security, retirement, and public assistance programs. The State of Oregon Employment Department reports that in 1995, 26% of all income in Coos and Curry counties was provided by transfer payments, including Social Security, Medicare, other retirement income, veteran's benefits, unemployment and food stamp programs. This probably hold true for Josephine county as well.

71,100 people live in Josephine county. Approximately 40% of these people live within a one hour drive of the watershed. Grants Pass is the county seat (pop. 18,120) and the largest city in Josephine county. Cave Junction (pop. 1,200) is the second largest community. Currently 15,000 people live in the Illinois Valley, scattered in the backwoods and small hamlets such as Taklema, O'Brien and Holland. Other hamlets include Kerby, and the habitations clustered around Lake Selmac, a popular recreation destination.

The population of Josephine county is focused in unincorporated areas. Much of this unincorporated area is identified as the "interface." Throughout the "interface" of forest and rural development there are a number of usually unnamed communities. These communities are often defined by little more than a small store or tavern, but they play a role in the dissemination of information and the formation of geographic-based community identity.

At a coarse level, demographics of the watershed analysis area seem to match those of the Province. As a point of departure, the Applegate Adaptive Management Area's Ecosystem Health Assessment lists a number of social and economic trends that, at a general level, could be applied to the middle Illinois River area.

These include;

- Strong population influx and residential development;
- Dispersed settlement patterns which have created widespread residential/forest interface;
- In-migration of younger, more educated ex-urbanites with strong environmental values and community interest;
- Dramatic shrinking of the local, traditional economic base (specifically, ranching, farming, and timber employment);
- Strong representation and economic contribution of "lone eagles," that is global entrepreneurs" with few ties to the local economy;
- Declining ties to the land for economic contributions and reliance on commuting to urban employment sites;
- Newcomers are less integrated into the community and less knowledgeable about the local ecosystem than in previous decades;
- An increase in a wide-range of recreation activities on public lands, creating endemic conflict between users and challenging management to incorporate these different interests.

Technical Reports and Referenced Articles

The technical reports that were used to produce this summary document are available on the World Wide Web at http://www/fs.fed.us/r6/siskiyou/news.htm.. These reports are also on file at the Illinois Valley Ranger District. The referenced articles are included in the back of each technical report.

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Key Questions used to focus Middle Illinois Watershed Analysis

Physical Science

What are the major physical features in the watershed?
What are the dominant erosion processes in the watershed? Where have they or where are they likely to occur?
What are the dominant hydrological features and processes in the watershed?
How do the physical features compare with others in the Illinois/Rogue River system? What is similar? What is unique?

Aquatics

Where is this watershed located in relation to the subbasin?
What is its relative importance to fisheries production?
What are the major creeks within the watershed?
Known fish distribution?
Basic morphological characteristics of stream valleys?
General sediment transport and deposition processes?

Terrestrial Vegetation

What is the array and landscape pattern of plant communities and seral stages?
What is the riparian condition?
What are the processes that have affected these?
How does this watershed compare with others in terms of disturbance?
Any unique plant communities?

Botany

What is the relative abundance and distribution of species of concern?
What is the distribution and character of the habitat?
What are the distinguishing biological features. How does this watershed compare with others?

Wildlife

What is the existing condition, what was the historic condition, what is the trend, and what is the desired future contion for:

a. The relative abundance and distribution of wildlife speicies of concern that are important in the watershed?

b. The distribution and abundance of their habitats.

c. The processes that affect changes to these species and their habitiats?

What are the road network and road maintenance needs for managing habitats for species of concern?

What and where are the conflict between various resources in terms of treatment reccommendations?
How can reccommendation conflicts be mitigated or minimized?

Social

What are the major uses of this watershed?
What is the ownership and land use pattern?
What is the main land allocations and objectives?
What makes this watershed important to people?

Table 2

MIDDLE ILLINOIS ROAD DECOMMISSIONING

for entire watershed

Former Road Number	Date of Decommission	Beginning Milepost	Ending Milepost	Length of Decommission	Sub-Watershed
4103112	Sept. 1992	0	0.5	0.5	Sixmile
4105034	Sept. 1992	0	0.11	0.11	Sixmile
4105072	Sept. 1992	0	0.1	0.1	Sixmile
4105770	Sept. 1992	0	0.3	0.3	Sixmile
4105772	Sept. 1992	0	0.9	0.9	Sixmile

TABLE 4

ROAD AND STREAM CROSSING DENSITY

By Sub- Watersheds using G.I.S. Data

Middle Illinois Watershed	MILES OF ROAD	AREA (Sq. Miles)	STREAM CROSSINGS (Sq. Miles)	CROSSING DENSITY (Per Mile)	ROAD DENSITY (Mi/Sq.MI)
Josephine	59.51	43	79	1.8	1.4
Kerby	115.28	24	76	3.2	4.8
Oak Flat	54.91	33.3	61	1.8	1.6
Six Mile	42.59	26.7	45	1.6	1.6

Table 1

Middle Illinois Watershed Transportation Analysis

(Data from TNA & TMS)

ROAD_NO.	ROAD_NAME	CONST.DATE	MILE POST	LENGTH	OPER_ML	OBJ_ML	JURISDICTION	SURFACE	P/S/C	SW
2524000	Spaulding Mill		0	0.72	2	3	FS	Agg.	P	S
2524015	Snailback	1973	0	1.09	2	1	FS	Agg.	S	S
2524031	Mill Spur	1980	0	1.97	2	1	FS	Agg.	S	S
2524033	Lumber Pile		0	0.12	2	1	FS	Nat.	S	S
2524048	Spaulding Mill-C Spur		0	0.38	2	1	FS	Nat.	C	S
2524767	Shadow		0	0.2	1	1	FS	Nat.	C	S
2524770	N/A	1980	0	0.5	2	1	FS	Agg.	S	S
2524771	N/A	1980	0	0.4	2	1	FS	Agg.	S	S
2524772	N/A	1991	0	0.38	1	1	FS	Nat.	C	S
4103000	Illinois River Road	1918	0	4.6	4	4	FS	St.	P	S
4103000	Illinois River Road	1918	4.6	8.7	3	3	FS	St.	P	S
4103000	Illinois River Road	1918	8.7	15.9	2	2	FS	Nat.	S	S/O
4103011	Star Flat	1915	0	1.4	2	1	FS	Nat.	C	N/A
4103025	Waterhole	1920	0	0.09	2	2	FS	Nat.	S	S
4103026	Snail	1920	0	0.41	2	1	FS	Nat.	S	S
4103045	Hoover Gulch	1950	0	0.4	2	1	FS	Nat.	C	S
4103054	Little Six Mile	1930	0	0.1	2	2	FS	Nat.	S	S
4103055	Private Spur	1930	0	0.2	2	2	FS	Nat.	S	S/O
4103058	Darling	1930	0	0.1	2	2	FS	Nat.	S	O
4103069	Mine Camp	1930	0	0.1	2	2	FS	Nat.	S	O
4103087	Rancheria	1930	0	0.7	2	3	FS	Nat.	S	O
4103087	Rancheria	1930	0.7	4.71	2	2	FS	Nat.	S	O
4103092	Blake	1930	0	0.3	1	1	FS	Nat.	C	O
4103096	House	1930	0	0.17	1	1	FS	Nat.	C	O
4103103	Motel	1930	0	0.75	1	1	FS	Nat.	C	O
4103131	Camp	1950	0	0.12	2	2	FS	Nat.	S	O
4103152	Briggs Camp	1961	0	1.2	2	2	FS	Nat.	S	O
4103157	Burtn Cabin	1965	0	0.27	1	1	FS	Nat.	C	O
4103754	MCT-2	1950	0	0.3	2	1	FS	Nat.	C	O
4103760	Burnt	1950	0	0.13	1	1	FS	Nat.	C	N/A
4103770	Wire	1940	0	0.1	1	1	FS	Nat.	C	O
4103780	Calypso	1940	0	0.76	1	1	FS	Nat.	C	O
4103781	Hill	1940	0	0.02	1	1	FS	Nat.	C	O
4103795	Illinois River Falls	1930	0	0.1	2	1	FS	Nat.	C	O
4103825	Star Flat Spur-A	1915	0	0.05	1	1	FS	Nat.	C	N/A
4103826	Star Flat Spur-B	1915	0	0.06	1	1	FS	Nat.	C	N/A
4103827	Star Flat Spur-C	1915	0	0.13	1	1	FS	Nat.	C	N/A
4105000	Six Mile Road	1965	0	6.76	2	2	FS	Nat.	S	S
4105061	Switch Six	1979	0	1.3	2	1	FS	Agg.	C	S
4105067	Six Ridge	1967	0	2.33	2	1	FS	Agg.	S	O
4105755	Hound Dog	1980	0	0.94	2	1	FS	Agg.	S	S
4105756	Dog Switch	1984	0	0.52	2	1	FS	Agg.	C	S
4105757	Under Dog	1980	0	0.25	2	1	FS	Agg.	C	O
4105760	Under Six	1980	0	0.12	2	1	FS	Agg.	C	S/O
4105767	Intercept	1974	0	0.91	2	1	FS	Nat.	C	S
4105774	Kodiak	1967	0	0.19	2	1	FS	Nat.	C	S
4105778	Moola	1974	0	0.42	2	1	FS	Nat.	C	S
4200000	Eight Dollar Mtn.	1964	0	1.05	4	4	CO	St.	S	S/K
4201000	Onion Camp Rd.	1966	0	2.2	4	4	FS	St.	P	S/J
4201000	Onion Camp Rd.	1966	2.2	12.2	3	3	FS	Agg.	P	S/J
4201016	Deer Creek	1915	0	2.14	2	2	FS	Nat.	S	S
4201020	Bore 1	1973	0	0.1	1	1	FS	Nat.	C	S
4201023	Mike's Gulch	1930	0	1.5	2	1	FS	Nat.	S	S/J
4201027	Bore II	1934	0	0.5	1	1	FS	Nat.	C	S
4201029	Josephine Creek	1930	0	4.3	2	2	FS	Nat.	S	J

4201065	Lacy	1966	0	0.3	2	2	FS	Nat.	C	S
4201072	Lackey	1966	0	0.33	2	1	FS	Nat.	C	S/J
4201090	Lower Fiddler	1973	0	1.17	2	1	FS	Nat.	S	S/J
4201090	Lower Fiddler	1973	1.17	1.7	2	1	FS	Nat.	S	O
4201091	Fiddler Mountain	1918	0	5	2	2	FS	Nat.	S	O/J
4201140	Hungry Hill	1984	0	0.73	3	3	FS	Agg.	P	J
4201140	Hungry Hill	1984	0.73	0.95	2	1	FS	Agg.	C	J
4201141	Onion Campground	1918	0	0.5	2	3	FS	Nat.	S	J
4201142	Onion Campground Ext.	1968	0	1.5	1	1	FS	Nat.	C	O
4201820	Day's Gulch	1918	0	8	1	1	FS	Nat.	C	J
4201844	Licorice	1950	0	0.5	2	1	FS	Nat.	C	S
4201845	Slap Jack	1950	0	0.5	2	1	FS	Nat.	C	S
4201850	Spokane	1950	0	0.72	2	1	FS	Nat.	C	O/J
4201861	Sluice Spur	1984	0	0.8	2	2	FS	Nat.	S	J
4201869	Gnome	1972	0	0.6	1	1	FS	Nat.	C	O
4201870	Whet Spur	1978	0	0.6	1	1	FS	Nat.	C	O
4201871	Stone Spur	1978	0	0.2	2	1	FS	Nat.	C	O
4201873	Coral	1972	0	0.35	2	1	FS	Nat.	C	O
4201881	Prairie Dog	1960	0	0.6	2	1	FS	Nat.	S	J
4300011	Canyon Creek	1993	0	1	2	1	FS	Nat.	S	K
4300011	Canyon Creek	1993	1	7	2	2	FS	Nat.	S	K
4300011	Canyon Creek	1993	7.7	2.9	2	2	FS	Nat	S	K
4300905	Sauers Overlook	1950	0	1.8	1	1	FS	Nat.	C	J/K
4300910	Free & Easy	1960	0	4.75	2	2	FS	Nat.	S	J/K
4300915	Giant Road	1950	0	0.5	2	2	FS	Nat.	S	J/K
4300920	Odell	1950	0	1.7	2	2	FS	Nat.	S	J/K
4300921	Tennessee Lookout	1940	0	1.45	2	2	FS	Nat.	S	J
4300922	Lynholm	1950	0	1	1	1	FS	Nat.	C	J
4300926	Upper Joesphine	1950	0	2	2	2	FS	Nat.	S	J
4300930	Sebastopal Crk.	1950	0	0.8	2	2	FS	Nat.	S	J
4300934	Jose Road	1950	0	2.5	1	1	FS	Nat.	C	J
4300948	Haveland Flat	1950	0	0.65	1	1	FS	Nat.	C	J
4400437	Success	1936	0	1.3	1	1	FS	Nat.	C	J

P = Primary S = System C = Candidates